

REMARKS/ARGUMENTS

Applicants thank the Examiner Mr. Chun-Kuan (Mike) Lee and the SPE, Mr. Fritz Fleming, for their time in conducting an Examiner's interview, this is truly appreciated. Receipt of the Interview Summary, dated October 19, 2006, is acknowledged and the comments/remarks stated on the Continuation Page of the same have been reviewed. It is believed that the claims, as recited hereinabove, alleviate the issue cited in the Interview Summary. That is, the task files have been added to the independent claims.

Claims 1, 4-7, 9-21, 24-26 and 28-43 remain pending and claims 2, 3, 8, 22, 23 and 27 have been canceled without prejudice. Claims 1, 4, 5, 20, 24 and 33 have been amended, as recited hereinabove.

Claims 1, 6-7, 9-14, 20-21 and 25-26 and 28-39 have been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Grieff et al. (US Patent No. 6,961,813) (hereinafter "Grieff") in view of Talati (US Patent No. 6,763,402) (hereinafter referred to as "Talati"). It is believed however that the foregoing claims, as recited hereinabove are patentable and all claims depending therefrom are patentable over Grieff in view of Talati.

The remarks appearing in the Interview Summary of October 19, 2006, have been reviewed and in connection therewith, it should be noted that unlike Talati, the claimed invention does not require the hosts to log in. Nevertheless, host task files have been added to the independent claims and in this manner, in the claimed invention, the first host or second host units concurrently access the device, as recited hereinabove.

More specifically, in the claimed invention, the first and second task files are each separately responsive to commands from the first and second host units, respectively, and as such they allow for "concurrently accessing the device, through the switch, by accepting commands, from either of the first or second host units, at any given time, ...". Furthermore, arbitration is not performed until after commands have been stored in the task files. In contrast thereto, Talati uses a single queue, i.e. buffer RAM 194 and performs arbitration of commands prior to queuing, which are some of the reasons, among others, for preventing Talati from "accepting commands, from either host, at any given time". [See Talati: Col. 5, lns. 26-30].

Furthermore, the combination of Grieff and Talati is believed to be erroneous as Talati is directed to the problem of interfacing a data storage device, a SATA device, to a

plurality of host data processing systems, through an IEEE 1349a bus and therefore uses bridges to convert the interface protocols and, whereas, Grieff is directed to a switch receiving input, through SATA ports, from multiple host devices and an arbiter module for assigning a priority scheme to received commands and for transmission thereof to a storage device through SATA ports. Therefore, Talati would not have been motivated to solve the problem solved by the claimed invention by using the teachings of Grieff, as Talati did not consider receiving input from SATA ports.

It is therefore believed that claims 1, 6-7, 9-14, 20-21 and 25-26 and 28-39 are patentable over Grieff in view of Talati and all claims depending therefrom are also necessarily patentable.

It is believed that Ng (US Patent 6,388,590) (hereinafter referred to as "Ng") also lacks separate task files for each host and therefore does not render the claimed invention obvious in combination with the foregoing references. For example, in Fig. 3, if the PC 52 is perceived as a host, there is only one task file 72b in the CD-ROM device 54. Furthermore, there is only one host and arbitration is not done after receipt of commands.

Claims 2-5 and 22-24 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Grieff and Talati in view of Ng (US Patent 6,388,590) (hereinafter referred to as "Ng"). It is believed that Ng also lacks separate task files for each host unit and therefore does not render the claimed invention obvious in combination with the foregoing references. For example, in Fig. 3, if the PC 52 is perceived as a host unit, there is only one task file 72b in the CD-ROM device 54. Furthermore, there is only one host. It is believed that the claimed invention is patentable over these references for, inter alia, the foregoing reasons. As a separate basis of patentability, the combination of the foregoing references, as the basis of rejection, is disagreed therewith since neither of these references suggests or hints at the teachings of the other for reasons indicated above in addition to others.

It is therefore believed that claims 2-5 and 22-24 are patentable over Grieff in view of Talati and in further view of Ng and all claims depending therefrom are also necessarily patentable.

Reconsideration and allowance of claims 1-7, 9 – 26 and 28 - 32 is hereby respectfully requested. Consideration and allowance of claims 33-43 is additionally respectfully requested. Applicants submit that the subject application is now in condition

for allowance and an early notice thereof is respectfully requested. Should any further amendment be required prior to passing the application to issue, the Examiner is respectfully invited to contact the undersigned by telephone at the number set out below.

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REMARKS REGARDING THE ADVISORY ACTION OF 12/5/06

Lastly and not related to the current office action, Applicant has noticed a statement that warrants attention in terms of correcting the previous record. In conducting a review of the first Examiner's Interview Summary, which was after the first interview and on page 4, paragraph 5, last sentence thereof, a statement was made as to " However, the applicant agrees that while the device is in an idle state, commands can be received concurrently.", which is disagreed with but was not mentioned in the last office action response. The foregoing quoted comment was made regarding Grieff. While Grieff is believed to receive concurrent requests, it cannot concurrently receive commands at any time including in idle state. This point is stated here merely to correct the record and serves no purpose as to the current rejections.

Comments further detailing the foregoing and responding to the requests made in the Advisory Action of December 5, 2006 are now made. In the Advisory Action, it is stated that the Applicant has not clearly provided a record pertaining to the interviews. However, this has been done in previously amendments/responses. For example, in the Amendment of July 5, 2006, at page 14, Applicant stated that "The remarks appearing in the Interview Summary of May 31, 2006, on the continuation page, basically summarize the Applicants' position with one exception, which will be indicated shortly, and will therefore not be repeated here. As to the exception, in the third line of Paragraph 5 of the Continuation Page of the Interview Summary after the words " , no further command can be received from the other host", we would add the words "until the current command is completed and acknowledgement thereof has been made." Similar statements were made in the Remarks Section of the Amendment of November 6, 2006. Accordingly, Applicant has clearly provided a record pertaining to the interviews.

Request As To The Reason For The Disagreement With The Statement “However the applicant’s agrees that while the device is in an idle state, commands can be receive concurrently”

With regard to the Examiner’s request, in the Advisory Action, as to the reason for the disagreement with the statement “However the applicant’s agrees that while the device is in an idle state, commands can be receive concurrently”, again, it is believed this was stated in the Amendment of July 5, 2006 and is repeated herein as follows:

“In summary, in Grieff, it is believed that, for a number of reasons, which, for the sake of brevity, are not enumerated here, at any given time, only one of the host ports (130 or 132) can send commands to the drive via the dual port adaptor. More specifically, while a host that has won arbitration is permitted to send a command to the dual port adaptor, the other host is prevented from sending commands to the dual port adaptor until the occurrence of a particular event -- assignment, by the arbiter module 112, of the highest priority to the host that is prevented from sending commands upon completion of execution of the command in progress [See Grieff: Col. 5, lns. 49-64 and col. 7, lns. 2-6]. Accordingly, the dual port adaptor of Grieff receives commands sequentially. In contrast thereto, in an embodiment of the present invention, as shown, for example, in Fig. 6 of the subject application, the host ports (310, and 320) are layer 4 SATA ports which each include a task file for receiving commands from a host regardless of the host winning arbitration. Thus, the hosts are not required to win arbitration prior to sending a command to the switch, as required in Grieff, rather, the two hosts, through their respective host ports can send commands to the switch concurrently, as recited in the amended claimed invention. Thus, it is believed that claims 1 and 20 are patentable over Grieff and therefore, all claims depending therefrom are necessarily patentable over Grieff.”

The foregoing quotation is believed to satisfy the Examiner’s request as to the reason for the disagreement with the statement “However the applicant’s agrees that while the device is in an idle state, commands can be receive concurrently”. Additionally, Grieff’s disclosure, as presented, cannot support accepting commands concurrently because the commands are believed to be stored in Host FIS Buffer and FIS Command Decoder120 [See Grieff: Col. 5, lns. 27-28 and col. 7, lns. 9-13], which receives only one

input and that is from the switch 110, thus, there does not appear to be any way to achieve concurrent acceptance of commands, at any time, even at idle times (See Grieff: Fig. 1,). For the foregoing reason(s), it is believed that, in Grieff, commands cannot be received concurrently even while the device is in idle state.

Evidences That Clearly Delineate the Difference Between a “Request” and a “Command”

In the context of Grieff, a “request” is not a “command” because a “request” appears to be an X_RDY primitive, which is defined in the SATA Specification, at Revision 1.0a, 7-January 2003, page 147. In Grieff, it is stated that “In an exemplary embodiment, the arbiter module 112 detects X_RDY primitive from the Link Layer state machines of each host port 130, 132 as the requests to gain access to the device.” (Grieff: col. 5, ll. 50-53 emphasis added). A “request”, according to the SATA Specification, is in the form of a “primitive”, an example of which is the X_RDY primitive, which is used by Grieff. Evidence for support thereof can be found in the foregoing SATA Specification, at page 147 in the Revision 1.0a, 7-January 2003. It is stated there that X_RDY (Transmission data ready) primitive indicates “current node (host or device) has payload ready for transmission”. R_RDY (Receiver ready) indicates “current node (host or device) is ready to receive payload”. To conform to the SATA Specification, a connection must first be established and X_RDY/R_RDY handshake be made before any command is sent.

“Command”, in the context of the SATA Specification, is issued to a device and is for performing a certain function. “The Register – Host to Device FIS is used to transfer the contents of the Shadow Register Block from the host to the device. This is the mechanism for issuing legacy ATA commands to the device” (Serial ATA Specification, page 187, sec. 8.5.2.1). This appears to be consistent with the way in which Grieff considers commands because in Grieff it is stated that “these commands involve the initial transfer of the command from the host to the device via a Host-to-Device Register FIS (Grieff: col. 7, ll. 42-44). The claimed invention is directed to “SATA”, in accordance with the SATA Specification, hence, a “request” is not intended to be the same as a “command”.

Additionally, Grieff itself draws the distinction between a “request” and a “command” by its use of the two terms. For example, in Grieff, it is stated that “In an exemplary

embodiment, the arbiter module 112 detects X_RDY primitive from the Link Layer state machines of each host port 130, 132 as the requests to gain access to the device.” (Grieff: col. 5, ll. 50-53 emphasis added). It is also stated that “When the Command Tracker state machine 114 detects that the serial ATA device has completed execution of a command (ReArb), the arbiter module swaps the priorities of the requests from the Link Layer state machines of each host port 130, 132” (Grieff: col. 5, ll. 56-60 emphasis added). Thus, Grieff clearly states that a request is sent to gain access to the device and further uses “command” as that which is being executed and not a request. Thus, Grieff cannot be interpreted to teach “sending a command that requests connectivity to the peripheral”, as suggested in the Advisory Action.

Evidences That Clearly Show Applicant’s Interpretation of Grieff Regarding “after receiving of concurrent requests to gain access of the device and after access have been granted to one of the host, ...”

To more clearly address this request, a response thereto has been divided into to sub-headings as follows:

In Grieff only one command can be received at any given time:

As previously noted, Grieff’s disclosure cannot support accepting commands concurrently because the commands, in Grieff appear to be stored in the Host FIS Buffer and FIS Command Decoder 120, which is shown to receive only one input and that input is from the switch 110 coupling the command. Thus, there does not appear to be any way to achieve concurrent acceptance of commands, at any time, even at idle times by the disclosure of Grieff.

Furthermore, in Grieff, because only the Host FIS Buffer & FIS Command decoder 120 stores received commands and also apparently decodes received commands (See Grieff: Col. 5, lns. 27-28 and col. 7, lns. 9-13), it is believed that Grieff can only receive and detect one command at any given time.

In Grieff processing of a received command is required before another command can be received

In Grieff, the state machines in Figs. 2-10 appear to offer further details of the Command Tracker SM 114 of Fig. 1 and in accordance therewith, one of ordinary skill in the art cannot reasonably interpret Grieff to enable “receiving commands from the other host after granting of access to one of the hosts”, as suggested in the Advisory Action. Evidence of the foregoing is disclosed in Grieff and quoted herein: “At step 1012, the link layer enters a loop that waits to receive an XRDY primitive. At step 1014, the link layer enters a loop that waits for FIS buffer to become available” (Grieff: col. 16, ll. 57-59, emphasis added). Therefore, since the FIS buffer, in Grieff, stores the current command and the current command must be processed while in the FIS buffer before the FIS buffer becomes available, another command cannot possibly be received, at least not according to the disclosure of Grieff. Completion of a command is detected by the SM 114, as discussed at col. 6, lns. 16-26 in Grieff. Furthermore, in Grieff, only after a command has been completed, can a new arbitration cycle begin (See Grieff: col. 7, lns 2-6).

In the Advisory Action, it is stated that “one of ordinary skill in the art, in viewing Grieff’s Fig. 1, may interpret that there appears to have more than one interconnection between the hosts and the peripheral, such as the two other interconnection right next to the multiplexer that directly connects the arbiter unit to the Command Tracker SM that may enable the carrying of data between the hosts and the peripheral, therefore ...” However, the signals shown to the right of the switch 110 that are shown between Command Tracker SM 114 and Arbiter 112 do not couple or carry command. These signals are: ReArb, ForceArbWinner, HostSelect, D2H_Xrdy, Force_D_R_ERR (shown going out of the SM 114 to Arbiter 112) and ArbWinner, (shown coming from Arbiter 112 to the SM 114). These signals appear to be signaling or indicative of an event, they are not, however, commands.

For example, the ReArb is used to “inform the arbitration logic that a command has just completed and that a new arbitration cycle can begin” (Grieff col. 7, ll.4-6), the ForceArbWinner, HostSelect: signals are used to “indicate which Host the arbitration logic should allow a connection to the device” (Grieff col. 6, lns. 41-42), the signal D2H_Xrdy is an output from Command Tracker state machine in transition from state

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AwaitDataFIS_DI to state FwdDataFIS_DI (See Grieff Fig. 4), the signal Forec_D_R_Err is an output from Command Tracker state machine in transition from state LinkIdle to state AwaitHostSYNC (See Grieff Fig. 2), and the ArbWinner signal "The Host that sent the command is determined from the ArbWinner signal from the arbitration block. (Grieff col. 10, ll. 49-50).

Therefore, it is believed that a person of ordinary skill in the art, cannot justifiably use these signals to interpret "enabling carrying of data between the hosts and the peripheral" nor can these signals be interpreted to be carrying or coupling commands.

It is believed that all requests made in the Advisory Action have been responded thereto, hereinabove, however, in the event there are further requests, the Examiner is invited to contact the undersigned. Again, Applicant wishes to thank the Examiner and his supervisor for conducting interviews.

Respectfully submitted,
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I hereby certify that this correspondence with all attachments is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450 on January 8, 2007 by Carmen Aviles.

